

LVI.—*Journey through Java, descriptive of its Topography and Natural History.* By Dr. FR. JUNGHUHN*.

[Continued from p. 48.]

THIS same species of tree (*Thibaudia varingiaefolia*), but decreasing more and more in size, accompanied us to the highest summit, which we reached by climbing along a rocky wall, descending perpendicularly in a westerly direction, and extending for about 500 feet at a height of not more than thirty to forty feet; but a cleft overgrown with shrubs extends at its base far lower down the mountain. On this journey the author also saw, amongst other gigantic fig-trees, one of fifty feet in circumference. They have not however the imposing appearance of other gigantic trees, as their short trunks are soon lost in thick branches, not of compact masses, but made up of a thousand single stems and air roots, forming a kind of trellis-work, or an agglomeration of columns. The author likewise saw, upon the Ungarang, another gigantic tree, apparently also belonging to the genus *Ficus*, with a trunk of about forty feet in height, and thirty to thirty-five feet in circumference, with immense polyp-like branches. The author observes, with respect to the richness of the flora of this mountain, that it would require at least two months to examine a space of 300 square feet; whereas he could only remain two days. A single tree, with its hundreds of parasitic plants, of the most varied families, would alone require a longer time.

Upon the Lawu were Casuarina forests at a height of 4200 Paris feet. They consisted of *Casuarina equisetifolia*, and formed, in isolated groups, small woods with sharply defined limits, which scattered here and there rise upon the grassy slopes, and alternate with more shady, dark green woods. From the extremities of their boughs hang down, yards long, the articulated sheathed branches, floating in the wind. They thus give to the locality a peculiarly lovely and beautiful physiognomy, such as the author had not before seen in Java, and which reminded him of the pine-forests of the north †. The ground in these forests is only occasionally barren, and covered with the fallen dry branches, just as in a larch-wood. It is also covered with species of *Rubus*, *Viburnum*, *Gnaphalium*, and masses of lofty Allang.

At the same time the author found a Casuarina-tree, built in so as to form a kind of temple in the ruins of Budentjeddo. The building-stones consisted of trachytic lava, and inclosed the tree closely. The trunk was three feet in diameter and about ninety feet in height. The author reckoned that these ruins must have existed before A. D. 1400, as Mohamedanism was introduced into Java shortly after that period, and he conjectures that the tree must now be above 600 years old. Upon another spot were Casuarina-trees, surrounded by the darkest and most shady oak-forests, whose fresh

* Translated from the 'Botanische Zeitung' for Sept. 29, Oct. 3, 10, 17 and 24, 1845.

† M. Junghuhn is a German, and comes from the Hartz.

colour exactly resembled those of the north, and imparted an indescribable beauty to the country. Pre-eminent in these woods was *Quercus pruinosa*, Bl., in the underwood of which the *Areca glandiformis*, Willd., with its red racemes formed a principal ornament. Blackberry-bushes with red berries, tree-ferns and rotangs were plentiful. Later appeared *Laurineæ* and *Thibaudia*.

Upon the Wilis a number of Javanese gathered coffee-berries upon the ground, and in a heap of fæces, consisting entirely of the beans caked together, which lay scattered about in numerous heaps and in some measure resembling the excrement of the dog. These heaps are deposited by a species of *Arctomys* (called by the Japanese La(w)ak), a kind of otter, which greedily devours the ripe coffee, and passes the berries undigested! The Japanese assured our traveller that these berries were the best of all!

We must refer to the author's second excursion through the mountain-forests of Panggerango, Manellawangie, and Gedé, in the year 1839, as the most complete description of the vegetation of Java. We shall let the author speak. "I proceeded up hill and down, on horseback along the road which crosses the back of the high tableland, sloping down in a westerly direction, and arrived on the 30th of March, 1839, at ten o'clock, at the spot where I am at present, that is to say, on the N.N.W. declivity of the Panggerango, where, at a height of 3212 feet, a Passanggrahan (the highest spot in the residence Buitenzorg) is built of planks and bamboos.

"Next, below the cottage (Bodjong-Keton) the ridge is formed of grass plains, on which are seen grazing numerous horses and cattle, while here and there lie scattered groups of miserable huts. Above this spot is only a dark forest, the limits of which appear to begin here close to the house, although it is next to coffee-plantations, which, shadowed by *Erythrina indica*, extend for several paals further, whilst the virgin forests only descend thus far on the side declivities of the ridge and in the unpassable clefts.

"But throughout, where the coffee cultivation leaves only a small open plot, these ridges are ornamented by a splendid vegetation of tree-ferns (*Chnoophora glauca*, Bl.), whose stems rising from out of the tall grass and bushes, from eighteen to twenty-four feet, form with their leafy covering lovely groups, and are only overtopped here and there by an isolated specimen of a Rasamala (*Liquidambar Althingiana*, Bl.), 150 feet and more. On moist places are seen the large pinnate leaves of species of *Amomum* and *Elettaria*, which, from the size and the light freshness of their green, stand next to the Pisang, with which they form luxuriant thickets, rising fifteen to twenty feet and above.

"As I could not expect the bearers of my luggage to arrive before the afternoon, and it was moreover prudent to send out a number of men to erect a hut on the top of the mountain, I determined not to set out before the 1st of April, but in the interim to visit the woods around Bodjong-Keton, up to a height of about 4500 feet, in which excursions generally five Japanese armed with hatchets accompanied me.

“ In these months only a very few of the large forest-trees are found in blossom, although the species, as a superficial observation of their foliage shows, is infinitely numerous. I now only found in blossom *Podocarpus latifolia*, Bl., *Vernonia javanica*, DC., *Pterospermum javanicum* (Jgh.), and two species of *Fagræa*.

“ The *Podocarpus* is in its leaves deceptively like the *Agathis loranthifolia*, Salisb., which I had not yet met with in this country, but which is cultivated in many splendid specimens at Pontokgedé, on the steep acclivities of the mountain. Its pyramidal growth, stretching up aloft and being at the same time very narrow, readily distinguishes it from all the other trees.

“ Of the *Fagræa* I should consider one, which is recognised from a distance by its large golden blossoms glittering through the leafy crowns, as *F. obovata* (*obovata-javana*), Bl., and the other as *F. lanceolata*, Bl., were they not both sixty to seventy feet high, large-stemmed forest-trees, whereas in the works of M. Blume they are described as parasitical and shrubby.

“ An interesting sight to the northern stranger is the occurrence of a syngenesious plant, as a forest-tree fifty to sixty feet high and large-stemmed, with flowers resembling our *Eupatoriæ*; it is the *Vernonia javanica*, DC., which occurs scattered in the woods at a height of from 3000 to 5000 feet, but by no means rare.

“ The Javanese give the name of Pohon-payor to a species of *Pterospermum* (*Pt. javanicum*, Jgh.), a very pretty tree, whose leaves are covered on the under surface with a rust-coloured silver-gray felt. The growth of these trees is more expanded than slender; but they are discernible above all others by the whitish brown tint of their foliage, which glitters afar off; they however by no means impart a physiognomy to the wood, as they are isolated among the *Rasamalæ*, which are pre-eminent from their number, and also exceed all others in size and mass, so that these woods may rightly be called *Rasamala*-forests. And they were so now, being in full blossom. Their green foliage was clothed with a reddish tint, for the circumference of their rounded crowns was covered all over with blossoms, the small spherical male catkins, which gave to the whole surface of the forest, especially seen from a certain distance, a red enamel, and distinguished above all others a *Rasamala*-tree, even when its stem was hidden in the bosom of the forest. According to the observations which I made several times on this and other mountains, the region of the *Rasamalas* lies, where they are the most numerous and grow highest, at between 2000 and 4000 feet. At 4000 feet they are already very isolated; at a greater height than 4500 feet I never saw them; but at 1500 feet they are still met with; from which it may be observed, that their lower limits cannot be ascertained with the same certainty as their upper, and that it is to be feared that these noble trees, whose occurrence is limited to a few mountains in the west of Java (on the Salak, Gedé, on some mountains between Tjanjor and the Bay of Palabuan-Ratu, and some others), will one day completely disappear: for their region is also of very small vertical extent, and is precisely at the same height at which coffee-

plantations are advantageously laid out. In order to obtain the sweet-smelling wood Randai, in which small bee-like but stingless insects (*Melipona vidua*, V.*) live high up in the crevices of the trunk, and also to measure the height of the trees, I had some Rasamalas cut down, and found the same results as in 1837 at Tjanjor; that is to say, fifteen feet for the circumference of the trunk at about twenty feet from the ground, ninety to 100 feet for the length of the stem, up to the height at which it is undivided and column-formed, and at which height it generally, but often not at all, slightly decreases in thickness, and fifty to eighty feet from the first bifurcation up to the top of the crown of foliage—therefore 140 to 180, or a mean of 160 feet, or most frequently 150 feet for the whole tree. When a space of the wood is felled, and the primitive forest, as is the case on the edge of the new coffee-plantations, is cut off in sharply defined lines from the cleared spot, on which the observer stands, there is nothing similar to the majestic appearance of such a forest, which is seen at one view in its entire height. The trunks rise straight up, and from their whitish colour, stand off in sharp lines from the dark background of the wood, in regular rows, as if they were columns which giants had turned and set up here. How small would a cocoa-palm appear by the side of such a giant, like a little switch, reaching scarcely to the first division of the trunk of a Rasamala! Although the trunks of the Rasamalas are less overgrown with *Lianæ* than the other trees, yet I found occasionally the foliage interlaced by a *Cissus*, the stalk of which, like a tightly drawn perpendicular rope, ascended for a hundred feet upon the stems (*Cissus macrophylla*, Jgh.).

“ At length, on the 1st of April, the morning sun, which was just rising above the forests of the Megamendong, illumined our path as we began to ascend from Bodjong-Keton through the coffee-plantations. Dr. E. A. Forsten (who during his residence here was engaged in entomological and ornithological pursuits) joined me, and we went onwards with good heart and spirit. Our attendants, the twenty Japanese, who with our travelling baggage were loaded with some sacks full of rice and other provisions, welcomed gladly the warm rays of the sun; for the temperature of 65° F. (14·5 R.)—the thermometer sank even lower in the shade—was sensibly felt by the naked bodies of the natives, accustomed as they are to warmth. The sky was clear and blue, and only a few light fleecy clouds were visible on it. But the high mountain regions and the wide plains in the north, which may otherwise be followed with the eye as far as the Roadstead of Batavia, were covered with a bluish, semi-transparent mist, in which isolated white vapour-clouds floated. The whole mountain-forest lay brightly illumined before us, and only a streaky covering of clouds rested upon the high tops of the Manellawangie. Inspired by this fine weather, we ascended the coffee-plantations: Forsten’s gun was heard afar through the wood, like a *feu de joie*; but it often cost some poor bird or an *Arctitis albifrons*, Cuv., its life. On the trunks of the Rasamalas, of which

* Lepelletier de Saint Fargeau, Hist. Nat. des Hymenopt. vol. i. p. 429.

some isolated specimens are still met with here and there, we saw a quantity of ant-paths, formed of a brownish earth. They lead up to the nests, which are seen hanging in shapeless brown clumps at a great height on the stems. On the limit of the coffee-plantations, which we soon reached, grows in freshly turned-up soil a small *Balsamina*; but frequent above all *Ageratum conyzoides*, which was here not higher than two to six inches, and so dense that the whole district appeared coloured bluish by its heads of flowers.

We now entered the dark shade of the primitive forests, and hung our barometers on the next tree (Dr. Forsten his Engelfield's barometer, and I my Fortin's), which gave for the forest-limit a height of 4590 feet, consequently a vertical space for the coffee-plantations from Bodjong-Keton to this spot of 1376 feet. As we proceeded we found the moist soil of the wood, which was covered with mosses and lycopodiums, ornamented with a beautiful little plant, which grows here in plenty, and discovers itself readily by its azure-blue flowers and the purple under surface of its leaves as *Scutellaria indica*, L.

Rasamalas had disappeared on the limits of the coffee-plantations, and with them the tree-ferns (*Chnoophora glauca*). In their place numerous trees, belonging to the family of the Laurels (*Laurinæ*), now occurred, but above all chestnuts, oaks, and *Schima Noronhæ*, among which *Fagrææ* were also still seen. Their trunks were indeed less gigantic than those of the Rasamalas, but they are more thickly overgrown with *Orchideæ* and ferns, more luxuriantly entwined with species of *Freycinetiæ* and *Calamus*, more frequently coated with numerous nest-ferns, and thus form a very shady and dark wood. In this wood grows solitarily, differing in this respect from the allied *Acaciæ*, *Acacia Saltuum*, Jgh., a slender little tree with almost pyramidal crowns and branches, which originate at different heights one above another, at the upper end of the trunk, and extend in an almost horizontal direction. A peculiar disease and protuberance of their leaf-petioles, which change into brownish excrescences, called to mind the beautiful *Inga montana*, Jgh.

Between the stems of the trees, overtopping the lower shrubs, which are composed of hundreds of different species, and fill up all the intervening space, is seen the *Areca glandiformis*, Willd., the little stems of which, hung with scarlet berries, notwithstanding their smallness, still exhibit the slender majesty of their family.

But, besides isolated *Orchideæ*, the ground in the woods is adorned by a small white-blossomed *Solanum* (*S. Rhinozerotis*, Bl. ?), *Begonia repanda*, Bl. En. 1. p. 97; *Polygonum corymbosum*, Willd., the form of whose leaf varies remarkably; several species of *Strobilanthes*, with knotty-jointed upright stems, and above all *Ardisia coccinea*, Jgh., whose little stem, scarcely three feet high, but woody and straight, bears round berries, of the most glowing scarlet. All the stalks of these plants rise out of dense beds of mosses, among which two tree-shaped ones, similar to our *Leskea dendroides*, several inches tall, especially catch the eye (*Bryum ferrugineum*, Jgh.), and a sterile undetermined species with a little stalk four inches

high, and alternate with numerous species of ferns, from two to ten feet high. Amongst the last, *Aspidium neriiforme*, Sw., is especially striking, with beautiful lanceolate foliage, which is elongated in a very peculiar manner, and winds about the trees almost like a cord. Here and there from the tops of the trees hangs down a string of *Cissus* 100 feet long, which is imbedded in young *Jungermannia* and mosses, and the enormous circumference of which (sometimes as thick as a man's thigh) excites astonishment.

This was the character of the forest vegetation which surrounded us, as we ascended on the N.N.W. acclivity of the Panggerango. From the great cleft which lay on our right proceeded the hollow rushing noise of the rivulet, and from the tops of the trees came the lovely song of a bird, whose well-known notes we listened to with delight, for it was the mountain-songster of Java, the *Muscicapa cantatrix*, which here welcomed us in its native habitat.

As we ascended, some of the little plants with which we had become acquainted since our entrance from the coffee-plantations into the woods disappeared; *Scutellaria indica*, which does not grow at a height exceeding 5000 feet, disappeared the first; *Ardisia coccinea*, *Begonia repanda* and *robusta* also soon vanished, and these were gradually followed by the species of *Calamus*, *Areca glanduliformis* and *Aspidium neriiforme*. But in their places we observed *Polypodium Dipteris* (which we had before met with at Tapos, and previously on the lake of Telaga-Bodas), but above all *Freycinetia* (*Fr. insignis*, Bl. and others), which, reaching their maximum at a height of between 5000 and 6000 feet, principally determine the physiognomy of the interior of the woods in this region; for on almost all the trees they climb in spiral windings, concealing the stems as it were under the weight of their fasciculate leaves, which resemble the leafy crowns of the *Pandanæ* or *Ananassæ*. Not less characteristic of the interior of the woods of this region is an arborescent Araliaceous plant, namely *Hedera aromatica*, DC., whose wide-spreading branches, extending thirty feet in length, which unite below in a very short stem, and are crowned with leaves and panicles of flowers only at their extremities, attract the wanderer's eye. Isolated, occurs a very peculiar species of *Pandanus**, whose dark green tufts of leaves rise directly at the ends of a slender stem thirty feet high and quite perpendicular, as if trying to imitate a palm-tree, or emulating the tree-ferns (*Cyathea polycarpa* and *oligocarpa*, Jgh.) which rise not less slender and palm-like in its vicinity. At times the circular *Asplenium Nidus-avis* is seen adhering to such a *Pandanus* stem, which perforates it in the centre, so that twofold and threefold crowns rise one above another on the stem, the uppermost of which however are easily recognised as the leaves of the *Pandanus*, and the lower ones by their light pisang-green as the whorl of leaves of the *Asplenium*.

Beneath the loftier trees (*Fagrææ*, *Acacia Saltuum*, &c. have disappeared) which compose the forest in this region, that is to say,

* It was barren, and could not therefore be more closely determined.

form its uppermost leafy vault, species of *Podocarpus* predominate, especially *Podocarpus imbricata*, Bl., which has a pyramidal growth only while it is young, but in its old age recalls the picture of the Rasamala-forests in this region by its gigantic height and its immense and straight stem. But here the boughs were already hung with species of *Usnea*, through which the cloudy mists pass.

We halted close to such a *Podocarpus*; for, besides the characteristic forms previously noticed, *Freycinetia*, species of *Calamus*, and *Areca glandiformis* had wholly disappeared, and *Asplenium Nidus-avis* became more rare, although the aspect of the forest (from the lower limits upwards) had not strikingly altered, excepting a greater covering of moss upon the stems and their diminution in the diameter of the stems. *Balsamina* and *Solanum Rhinocerotis* alone still accompanied us. To determine this region, we took an observation, according to which the elevation attained was 6510 feet. Therefore in a vertical space of about 2000 feet, from the termination of the coffee-plantations upwards, we had passed by those different vegetable forms. It was now ten o'clock and gray mists enveloped us.

We had screwed our perforators for suspending the instruments to the stem of a fern which was met with somewhat lower down, and was distinguished from afar as distinct from *Chnoophora glauca*. Its growth is less vigorous, less in circumference than that of *Chnoophora glauca*; its fans are much smaller and shorter, fewer in number, and of a less fresh green than in that species; its stem is more slender; but its height is the more imposing, being on an average twenty-five feet, in some which I measured thirty-five, and in one even forty feet, rising perpendicularly just like species of palms. The perfectly horizontal direction of the fans, which are united to the ends of the stem only in (single) rows and very few in number, generally only five, six or seven, and, like the spokes of a wheel, lie almost entirely in a plane, so that the form of the whole is shield-like, is very remarkable. This tree-fern is distinguished therefore at the first glance by its different habitus from *Chnoophora glauca*, whose fans are inserted at different heights one above another in several series from the apex of the stem, and do not grow upwards till they form an angle of 45° , before they bend over in a curve. The fans of the *Chnoophora lanuginosa* (for so we call our tree-fern) only rise upwards as long as they are young and undeveloped. This *Chnoophora* is also worthy of notice for the region to which it belongs, for we have never seen it lower than 5500 feet, whilst it rises to the highest summits, 9200 feet; and even then its stems, thickly clothed with layers of moss, scarcely decrease from fifteen to twenty feet in height.

After finishing our barometrical observations, and filling our bamboo-canes in a little brook which runs down just below our halting-place in a trachytic channel, we set out again.

The woods now assumed another aspect, and their acclivities became more and more steep. All other species of trees disappeared, and soon the forest consisted almost solely of some species of the families of *Laurineæ* and *Araliaceæ*, but especially species of *Thibaudia*. The stems of the trees became shorter, slenderer, rose less

perpendicularly, in a more oblique direction from the soil, and turned away from the slope, as if they strove to rest on the steep surface of the rock at a right angle; they became more and more bent, stood thicker and more compact, and were at the same time covered over with thick layers of mosses from the very roots up to the extremities of their stems. Such a ragged moss-covered forest presents indeed a very peculiar aspect.

[To be continued.]

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

Jan. 13, 1846.—William Yarrell, Esq., Vice-President, in the Chair.

Mr. Gould described a new species of *Nyctibius*, which he proposed to name

NYCTIBIUS BRACTEATUS. *Nyct. castaneo-fuscus; scapularum apicibus, et abdomine, maculis albis, quasi bracteis, ornatis.*

The general plumage rich chestnut-brown; the feathers of the head, back and breast freckled with black, and with an irregular-shaped blotch of black at the extremity of each feather; near the tip of each of the scapularies a spot of white encircled with black; on the lower part of the abdomen are two lunar-shaped marks of white, formed by a square spot of silvery white, bounded above and below with a narrow line of black, occupying the extremities of the feathers; wings dark brown, with the exception of the outer margins of the primaries, which are cinnamon-brown; tail chestnut, crossed with numerous bars, composed of two irregular narrow lines of black, and with a small spot of white at the tip; under tail-coverts buff, with a square spot of white at the tip.

Total length, $9\frac{1}{2}$ inches; bill, $1\frac{1}{4}$; wing, 6; tail, $5\frac{1}{2}$; tarsi, $\frac{1}{2}$.

Hab. Santa Fé de Bogota.

Remark.—This species is the least of the genus that has come under my notice; the description is taken from a fine specimen in the collection of the Royal Institution of Liverpool.

January 27.—William Yarrell, Esq., Vice-President, in the Chair.

A paper by Professor Owen was read, containing the following notes on the dissection of the Chimpanzee (*Troglodytes niger*) which died in the menagerie of the Society Dec. 29, 1845:—

Chimpanzee (female):—Weight $42\frac{1}{2}$ lbs.

	MEASUREMENTS.	
	ft.	in.
From vertex to under-side of heel	3	6
From vertex to coccyx	2	0
From trochanter major femoris to external condyle of femur	0	$9\frac{1}{2}$
From external condyle of femur to external malleolus	0	$9\frac{1}{4}$
From heel to end of middle toe	0	$8\frac{3}{4}$
From distal end of first metatarsal to distal end of phalanges of first toe	0	$2\frac{1}{2}$